Motioning and studying rapid development of natural hazards along receding lake environments using laser scanning data

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Detection of changes is a key component for monitoring landscape dynamics. Such detection requires handling the complexity of these environments and the level of detail that is needed in some cases. One of the rapidly changing environments worldwide is the Dead Sea, whose lake level has been dropping by a 1 m/yr rate or higher, as a combination of human- and climate-induced effect. Newly exposed coasts are subjected to development of new stream channels in the alluvial fans along its shores, and collapse sinkholes that endanger the natural environment, human population and infrastructures. In order to detect and quantify changes of these geomorphic features, we describe in this paper application of airborne and terrestrial laser-scanning technology and methodologies developed to characterize them. Use of laser scanning data facilitates the analysis of features that could hardly been characterized by conventional means, let alone in detailed 3-D. The broad scope that laser scanning data provide better understanding of evolitional and developmental processes therein. We detail the new methodologies for detecting such phenomena, accurately characterizing them, and determining their modification over time. The results of this study are of paramount importance for the development of appropriate strategies for future regional planning.